



Wooden Table

Written By: Nick Raymond



TOOLS:

- [Chisel \(1\)](#)
- [Chop-saw \(1\)](#)
(optional)
- [Circular saw \(1\)](#)
- [Clamps \(4\)](#)
able to open 3' wide
- [Combination square \(1\)](#)
- [Drill press \(1\)](#)
- [Electric Sander \(1\)](#)
with various grit sandpapers from 60-150
- [Electric drill \(1\)](#)
- [Electric planer \(1\)](#)
(optional) to reduce the thickness of boards, or if you plan on using recycled or reclaimed lumber
- [Hand planer \(1\)](#)
(optional)
- [Pull Saw \(1\)](#)
- [Rasp \(1\)](#)
- [Ratchet and socket \(1\)](#)
socket size depends on type of nuts purchased
- [Router \(1\)](#)
- [Router Bit \(1\)](#)
5/32" width
- [Router Bit \(1\)](#)
- [Rubber Mallet \(1\)](#)



PARTS:

- [Wood \(2\)](#)
- [Wood \(4\)](#)
- [Wood \(2\)](#)
- [Wood Biscuits \(25\)](#)
to align boards together
- [Kerf Mount Corner Brackets \(4\)](#)
purchase online at www.rockler.com
- [Hanging bolt and nut \(4\)](#)
available at local hardware store or www.rockler.com
- [Wood screws \(1\)](#)
- [Wood putty \(1\)](#)
(optional)
- [wood stain \(1\)](#)
(optional) to change the color of the wood
- [Wood Sealer \(1\)](#)
(optional) to protect wood from water damage

- [Table saw \(1\)](#)
- [Tape Measurer \(1\)](#)
- [Vise Grips \(1\)](#)
to install hanger bolts
- [Wood glue \(1\)](#)
TiteBond II or Elmer's Glue recommended

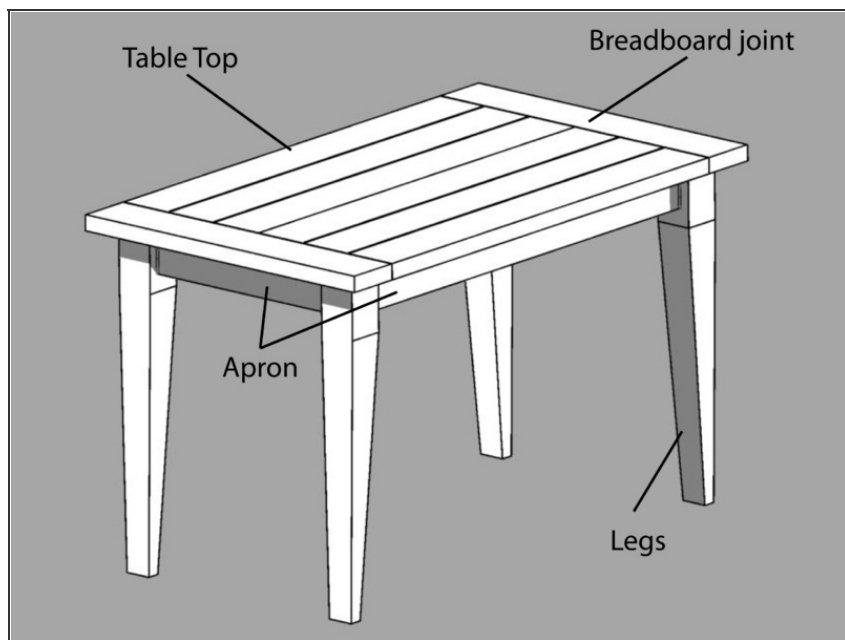
SUMMARY

Before moving off to college I wanted to build something that would be suitable as a kitchen table and double as my desk for studying. It needed to be sturdy and robust enough to last through college and for the years to come, yet I did not want to build a piece of furniture that would require a moving truck and four guys to move it up a flight of stairs.

Using mortise and tenon joints in combination with inexpensive kerf-mounted corner brackets, I was able to build an attractive and rigid table that can be disassembled and reassembled all by myself.

The type of wood you use may vary depending on your location, price range, and personal preference. Soft woods like pine and cedar are more common and usually available at most lumberyards as dimensional lumber. Hardwoods, such as maple, cherry, and oak, tend to cost more and may be more difficult to work with, especially when using hand tools.


Step 1 — Design plans



- The length and width of kitchen tables vary, but a comfortable table height is right around 30" tall.
- This table uses mortise and tenon joints for the legs and apron structure, with breadboard joints at the ends of the table top. These breadboard joints reduce any movement that may occur from the expansion and contraction of the wood over time and keep the table rigid.
- For more information about mortise and tenon joints, check out master woodworker Len Cullun and his [Workhorses](#) article.

Step 2 — Tabletop



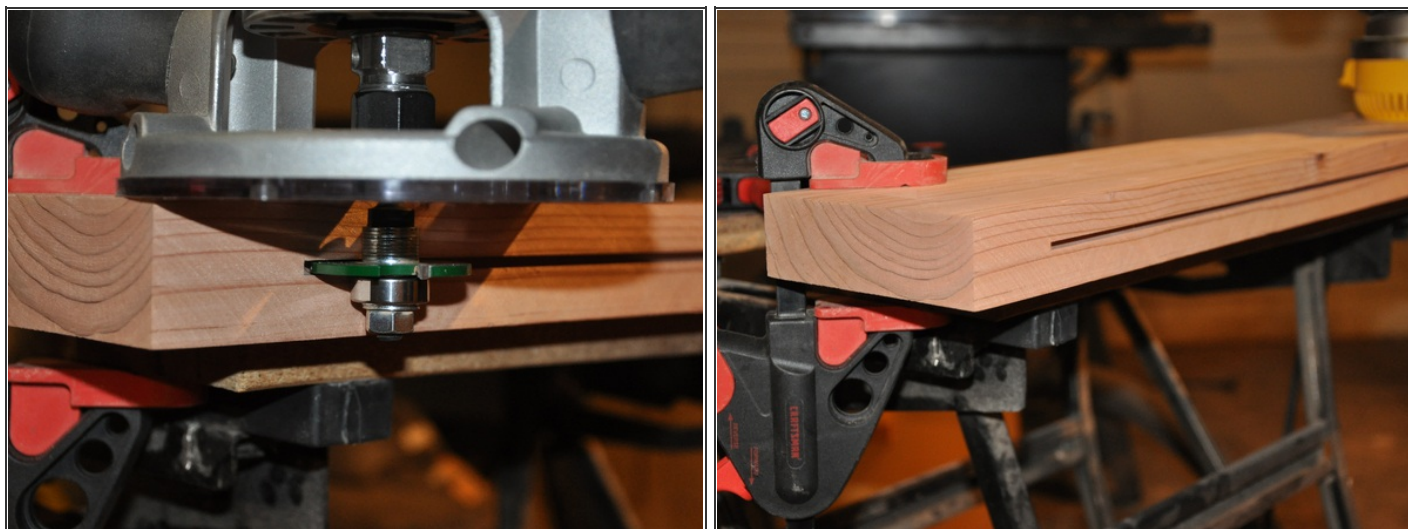
- I purchased cedar wood from the local lumberyard in the form of dimensional lumber. It is relatively inexpensive and easy to find; however, other woods will work just as well.
- **NOTE:** The actual dimensions of a 2x4 are 1½" x 3½" as a result of the final planing process to produce "finished" wood at the lumber mill. Keep this in mind if you choose to design your own table or when you purchase dimensional lumber for any of your other wood projects. 
- Cut the 2"x6"x8' boards in half to produce boards that are 48" in length. These will become the table top.
- Use a table saw to cut ¼" down each side of the boards to remove the rounded edges. This creates a sharp straight face and will ensure a tight fit between the boards. The boards should now be 5" wide and 48" long.

Step 3



- Place the boards on the ground and rearrange them until you are satisfied with their appearance and order.
- Use a pencil and mark the boards 1,2,3... as a reference for when you reassemble and glue the wood together.
- This is your opportunity to hide any knots or defects in the wood. Only one side of the tabletop will show, so you can hide imperfections in the wood if you plan accordingly.

Step 4



- Use a router with a biscuit joiner bit to cut a 5/32"-wide groove along each side of the boards.
- For the two outermost boards, cut a groove on only one side. My tabletop was made from six boards, so board #1 and board #6 required only one side to be grooved.
- When cutting the grooves with the router, stop 2" from each end. This will leave plenty of room for making the tongue of the breadboard joint and will ensure that the joint has plenty of strength.

Step 5 — Assemble the tabletop



- Insert #10 wood biscuits (small oval-shaped discs of wood) into the grooves every 8" inches. Use plenty of wood glue and do not worry about excess glue dripping or running down the sides.
- Spread the glue evenly over both surfaces of the joint and all over the biscuits.
- The primary function of the biscuit is to align your boards to reduce the need for sanding later on. If used correctly (lots of glue!) they will adhere to both sides of the grooves and help to strengthen the joint.
- Biscuits are primarily made of compressed beech wood. When coated in waterbased glue they will swell up and help lock the joint tight.



Step 6



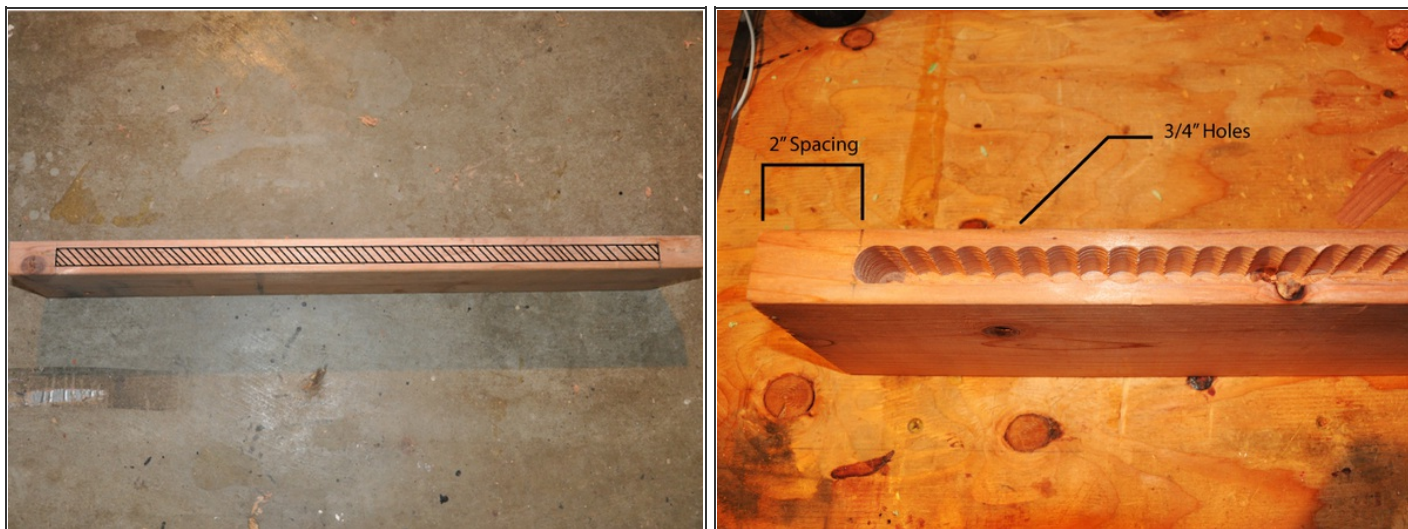
- Use four clamps to hold the boards together as they dry. Alternate the orientation of the clamps so that the first and third clamps are on top and the second and fourth are on the bottom. This ensures an even distribution of clamping force and prevents the wood from bowing under the force of the clamps.
- Place scraps of wood between the the clamps and the edges of the table. This will prevent any markings or damage to the table from the clamps.
- Read the directions on the wood glue and allow the glue to dry. I waited 48 hours before removing the clamps, just to be safe.
- When tightening the clamps, glue will come out through the joints. Use a damp cloth to remove any excess glue. The trick is to keep the cloth damp at all times and use a water-based glue like [TiteBond](#) or [Elmer's Wood Glue](#). This ensures an easy clean up.

Step 7



- When the glue has dried, cut the table to the desired length by trimming both ends of the tabletop using a circular saw. Make these cuts as straight as possible; these edges will be used to form the ends of breadboard joint. Remember to include the length of the two breadboard tongues in your final measurement. This section of my tabletop was 43" long.
- With the tabletop cut to size, it is now time to cut out the breadboard tongues. Measure one inch from the edges you just cut and draw a line across the top. Use a router and a 1/2" router bit to cut away the material at a depth of 3/8". Flip the tabletop over and repeat the process on the other side to create the tongue of the breadboard joint.
- Unlike a standard tongue-and-groove joint which is visible from the side profile, the tongue of the breadboard joint fits inside a long narrow pocket in the end piece and is not visible from the side. Remove a 2" section from each end of the breadboard tongue. Use a rasp and sandpaper to produce a flush surface.
- Finally, create a slight bevel at the ends of the tongue using a chisel or rasp. This will make final assembly much easier.

Step 8



- To make the end pieces of the table take a 2x6 and cut 2 pieces at a length of 30" each. These will be given the long narrow pocket that will fit around the tongue of the breadboard joint. This will reduce any warping or movement of the table top.
- To make the long narrow pocket, mark out a gap 3/4" wide in the middle of the board's edge. Use a drill press with a 3/4" Forstner bit to remove the bulk of the material within the marked region to a depth of 1".

Step 9



- Use a sharp 3/4" beveled chisel and mallet to remove the remaining material. Keep the walls flat and make sharp 90° corners at both ends.

Step 10



- Test the breadboard joint to see if it is a snug fit, but not too tight. This may require a tap with the mallet, but if it is too tight you will need to adjust the width of the tongue using sandpaper or a chisel.
- Be careful not to split or crack the wood if using a mallet.
- From the side view the tongue is not visible, producing a very attractive and strong joint.



Step 11



- Spread glue all over the tongue and inside the narrow pocket. Use clamps or straps to secure the end pieces onto the tabletop while the glue dries.
- Clean up any excess glue before the glue dries, as seen in previous steps.

Step 12 — Aside: Wood movement and breadboards



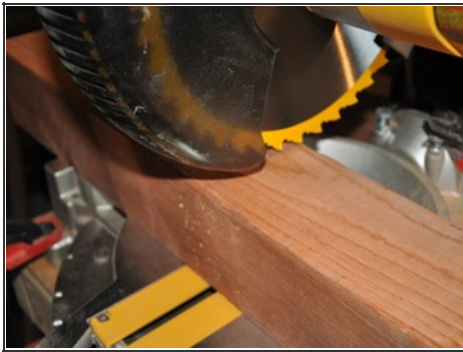
- Wood is a dynamic material. It will expand and contract across the grain with changes in humidity and temperature. Different varieties of wood will expand and contract by different amounts. This movement is primarily across the width of the grain, not the length.
- Because of this, a breadboard end requires special consideration. The breadboard end is attached to the table across the end of the grain. You need to make allowances in the breadboard for the table top to expand and contract.
- For instance, the tongue should be shorter than the mortise in the breadboard end, so it has room to move without being crushed.
- As well, you should only put glue on the middle one-third of the tongue, if that. Many woodworkers use strictly mechanical fasteners (i.e., dowels or screws in an oblong hole) to allow the table to move with the seasons.

Step 13 — Sand the tabletop



- After the glue has dried sand the tabletop. Start with 60-grit sandpaper and pay close attention to the area where the boards meet. Use the lower grit sandpaper to remove any high spots or ridges.
- Work your way up to 150-grit sandpaper. Be sure to move back and forth over the entire tabletop and avoid spending time in one small area while you work.
- Work in a well-ventilated area and wear a dust mask.

Step 14 — Make the legs



- Cut four legs each 30" long from the 4x4's
- **(Optional)** Add a taper to the legs for an aesthetic touch. Use a hand plane to remove the material and shape the legs.
- Most hand planes that you purchase from a store do not come pre-sharpened. Consult Len Cullen's article on [Tuning Planes And Chisels](#) to learn how to sharpen the blade of your hand plane before tackling the legs. A sharp hand plane makes quick work of these tapers, producing a smooth level surface.
- These wooden legs incorporate a taper on three of the four sides. The pieces start out being 3½" wide at the top, and reduce to 2½" wide at the bottom. Be sure to draw a reference line on both sides of the wood if planing by hand to ensure a uniform removal of material.

Step 15

- At the top of the legs use a combination square to draw your reference lines for the mortise pocket. Each leg will require two mortises to form the corners, so be careful to think about how you want the legs to be oriented if you added a taper in the previous step.
- Use a 3/4" Forstner bit to remove the bulk of the material to a depth of 1½". Complete the mortise by using a beveled chisel to square up the corners and trim the walls flat.

Step 16

- Shown here are the corner brackets that are used to secure the legs to the apron of the table. They also make it relatively easy to disassemble the table.
- The corner brackets bolt onto a pair of hanger bolts that are screwed into the legs of the table and tie the frame of the table together. A hanger bolt has both wood threads and machine threads, one at either end.
- These particular brackets are called "kerf-mounted corner brackets." They lock into a notch in the frame of the table. The hanger bolt goes through the center of the bracket, and as the nut is tightened on the machine threads the bracket bites into the notches and pulls the frame together.
- Before installing the hanger bolts and corner brackets, it may be helpful to make two smaller tenon joints from scrap material to check the fit before drilling the pilot holes into the legs. The instructions that came with my brackets included dimensions for the installation; however, they should be considered more of a guideline. Test the fit using these mock-up tenon joints before drilling or cutting into your final pieces.

Step 17



- To install the hanger bolts into the legs use a hand plane to shave off a flat surface between the two mortises of the legs. The objective is to create a flat surface on the corner of the leg.
- Drill pilot holes for the wood threads of the hanger bolts, and use a pair of vise grips to screw the hanger bolt into the wood.

Step 18 — Cut the tenon joints



- Take the 2x4 and cut the lengths required for the apron. Do not forget to include the 1½" on each side for the tenons.
- Mark out the reference lines and use a hand saw to cut out the tenons.

Step 19

- Cut a groove near the ends of the tenon that is 1/8" wide and 1/4" deep. Use the thin planing blade of a table saw and run the piece over the blade, being very careful.
- This is the contact point for the corner bracket that will tie the legs together with the apron.

Step 20 — Assemble the table frame

- Test the fit of the mortise and tenon joints. There should be minimal play. If the tenon does not fit in the mortise, do not use a hammer to force the pieces together. You could accidentally crack the wood and ruin the joint. Take your time and use a rasp or a sharp chisel to adjust the fit as needed.
- Once all of the pieces fit together, install the corner brackets using washers and nuts.

Step 21 — Cut mounting brackets



- To make the brackets that will secure the tabletop to the frame cut four 3"-wide blocks from the remaining 2x4 material.
- Cut these blocks in half along the diagonal to create eight triangular pieces.
- Drill two pilot holes in each triangle approximately 1 inch from the edges. To do this, place the block on a flat surface and drill straight down (not perpendicular to the face of the triangle).

Step 22 — Mount the tabletop to the frame



- Flip the tabletop upside-down and place the frame on top with the legs facing up.
- Position the triangular brackets 6" from the corners of the table and drill pilot holes into the bottom of the table. Do not drill through the tabletop or apron.
- Use wood screws to secure the brackets in place.

Step 23



- Flip the table over, grab a few chairs and test out your new table!
- For the final step seal the wood. Depending on the type of product you use this can change the color and appearance of the wood, but more importantly it will protect the wood and prolong the life of your table.

Enjoy your new table. Next you can build a set of benches with any remaining wood that you have left over and learn how to make chairs to match. If you ever have to move, simply unscrew the tabletop from the frame and unbolt the eight nuts from the hanger bolts. The frame then all comes apart and you can move to your new home without having to ask your friends to help (but you should call them anyway because they will want to have dinner with you at your cool table!).

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